

Rear Admiral Bartholomew W. Hogan MC USN - Surgeon General
Captain Leslie B. Marshall MC USN (RET) - Editor

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Marital Adjustment and Military Service

Everyone who enters the military service is given abundant advice from well-meaning relatives and friends. The physician is no exception. This advice, together with many misconceptions, can interfere with personal adjustment and professional growth while in the service. Some physician veterans feel that the service seriously disrupted their personal life and threatened their career; most of these physicians entered the service with a biased attitude. They were unprepared for the stresses they found and remained blind to the many advantages from which they could profit.

This is not to claim that there are no stresses or annoyances associated with military service. There are indeed many, and a clear understanding and appreciation of them is necessary for a smooth and profitable adjustment. Only after this can one start the careful planning that is so important.

Entering the service affects not only the physician, but also his entire family because there is a fine balance of emotional stability between various family members. Marital adjustment is the core of family stability, thus, any disruption in it will profoundly affect all members of the family.

The physician entering the military service faces many of the same stresses that the average citizen who enters military service does. However, he seldom realizes that he is fortunate in not being subjected to some of them. Although the physician may experience a drop in income, it is not as marked as that of the average inductee. Although placed in uniform and given a serial number, he does not experience the extreme loss of identity and self-esteem that regimentation usually encourages. By contrast, the physician maintains his identity as belonging to his profession and is able to continue in his profession while in military service. It is true that he may not be able to do exactly the type of work he has been doing, but it will at least be in a related area. Usually, it is not appreciated that, although the physician may have an orientation course of several weeks, it certainly cannot be compared with the physical and emotional stresses of basic training or "boot camp." The stresses the physician must face are fewer, but they present some unique aspects.

Although the title of this article implies the primary concern with marital adjustment, an appreciation of some of the many factors by which it will be influenced must be understood. Some of these factors may constitute stresses only to certain types of individuals; others may be actually beneficial during military service; still others are almost universally felt as stresses.

Almost invariably, there is some change in the financial situation. Although those entering the service from internships and residencies may anticipate a raise in income, the large amount of ready cash which is

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Editor

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necessary to take care of all the details of entering service is seldom readily available. Debt incurred during previous years of study may delay financial stability. Those physicians who have already started a practice must anticipate a very definite loss of income and, also, there may be many additional costs involved in leaving a practice.

Geographic and cultural changes constitute another major stress. Many will eagerly anticipate living in another section of the country assuming it will present no particular problems, but minor and sometimes major frustrations are created by these changes. A physician and his family who have been used to concerts, supermarkets, and television may find it disconcerting to live on a small isolated post where few conveniences are present. The effect of cultural changes is even more striking if he is sent overseas. The charm of old world culture is often dampened by outmoded appliances, a strange diet, and frustrating language barriers.

Some physicians will find professional isolation difficult. The possibility of being assigned as the only medical officer on a small post—although not likely—certainly exists.

The effect of changes in prestige and responsibility are not as easily admitted. Entering service usually results in some decrease in personal prestige, but usually demands greater responsibility. This decrease in prestige is the result of the regimentation and uniformity which is inherent in any military organization. The physician who has just completed his internship or residency feels he need no longer be considered "just another student," but is entitled to be considered an individual, competent to practice medicine in his own right. In the service, however, he is not always called "doctor" and is not granted all the prestige this title symbolizes. The physician who leaves private practice will undoubtedly miss much of the satisfaction he received from his respected position in his community. In the service, he will find that other officers are thought of as being far more important. The Medical Corps is, after all, considered in much the same way as the Quartermaster or Judge Advocate Corps: All are "service troops" not usually engaged in actual combat. The physician whose self-esteem is too dependent upon having a continuous parade of grateful patients and thankful relatives may have a trying time in the service. He will soon discover that his job is basically to "conserve the fighting strength." His job is not to make people happy, but enable them to function in training or in combat. Keeping the soldier functioning is not always what he consciously or unconsciously wishes.

Separation from friends and relatives is an additional stress. Most people have the need to confide in others, or ask their advice. The loss of such close relationships is not completely compensated for by new acquaintanceships.

All of these stresses and changes may directly or indirectly influence marital adjustment, but the single, most important stress is separation of

husband from family. This separation will affect all members of the family. Only those marriages devoid of real meaning will not be adversely affected. Such "empty marriages" may, in fact, appear to be helped by the separation, for the separation may delay an open rift by providing a breathing spell. A good marriage is a symbiotic relationship and when separation occurs each partner is affected. Immediately following separation, adjustments must be made and compensations found. Then again reunion will necessitate certain adjustments. The longer the period of separation, the more traumatic it will be to good marital relations. Couples who have been married only a short time—say, less than a year—may be less sensitive to separation, but it is more likely to endanger the future of the marriage. These couples have not had a chance to experience the period of "working through" which is so necessary to solidify marital bonds.

The physician who has the ability to withstand tensions which develop from such stresses and to find new emotional supports will have little difficulty. Inability to do so will result in varying degrees of anxiety which will constrict his professional and social capacities. If the anxiety becomes too great, more serious consequences will develop. Probably anxiety is more commonly defended by a great variety of mechanisms which—although unconscious—are just as destructive. Anxiety is often disguised by the development of new attitudes. For example, an overcritical cynical attitude toward everything in the military service may camouflage considerable insecurity relating to taking responsibility. Unwarranted open hostility toward superiors may be considered unwise, but covert hostility may appear automatically in a multitude of passive-obstructionistic ways. Reluctance to perform administrative duties is a common reflection of such an attitude. Regression to immature ways of acting, such as excessive drinking, may be similarly employed. Flight into fantasy was noted commonly in World War II and continues to be an unrealistic solution to the stresses. By this means, all faults and difficulties of the home situation become vague and people "back home" become paragons of goodness and beauty. Along with such fantasies, being reunited—even although reunion is clearly impossible—becomes the only possible solution.

The wife also faces many of the same stresses as her husband, but separation for her is the most important. During World War II, it was the wife—not the serviceman—who had the most difficulty adjusting to separation. Separation is always accompanied by some degree of regression and an accentuation of dependency needs. These needs are not easily satisfied and may be even further frustrated by the increased responsibility she must assume. Even if there is only a short delay before she can join her husband, she may be left alone with many tasks, such as renting a house or arranging for transfer of children to a new school. If she goes overseas to rejoin her husband, there are even more details for which she must assume responsibility. Even if the wife has the good fortune to accompany

her husband, she must give up friends, familiar surroundings, and the sometimes welcomed council of relatives.

The wife may attempt to deal with these stresses in a variety of ways. Most commonly there is an intensification of the maternal instinct with a consequent increased interest in the home and children. This is a desirable and partial solution. There are other methods which are less desirable. As in the case of the husband, the wife may also employ a variety of immature attitudes in an attempt to decrease her anxiety. She may be chronically indignant because her husband is being "misused to do sanitary inspections." Others may complain that their husbands are "just sitting around" or "only treating wives and children of servicemen." Such statements may have some grain of truth, but the important thing is that attitudes reflected by such statements may really be defenses against anxiety. An example would be the anxiety which results when a wife assumes additional responsibility during her husband's absence. Sometimes, resentment is directed toward the husband for "letting himself be taken" or "not being smart enough to arrange for an assignment near home." During World War II, an emotional conflict frequently developed in the husband due to his wife's attitude. Prior to, and during, combat he was torn between his wife's attitude that "someone else should take the risks," and the loyalty he felt for his unit. Similar conflicts may develop in physicians in the service. An exacerbation or precipitation of psychosomatic illness, such as asthma or peptic ulcer, may occur in the wife when her husband enters the service. Because these conditions usually involve conflicts over dependency needs, this is understandable.

Separations of a few weeks will be difficult, but can generally be tolerated. Adjustment to more prolonged separations depends largely on the wife's "emotional aptitude for waiting."

After she joins her husband, there are still other problems. The fantasy that everything will be perfect if they can just be together will be shattered. The longer the separation, the more problems there will be with reunion. If they had only been married a short time prior to the separation, they will be at a serious disadvantage and almost may have to start over. If a child has been born during the separation, the reunion may be hampered by the great amount of time the wife must devote to the infant's care.

When the physician with children enters service, he should realize that his children will also be involved in making adjustments. Changes in friends and school will be less of a problem than is usually believed. It is also encouraging that children adjust more easily to living in foreign countries than their parents. Separation from the father is far more important for them. This separation is more traumatic for boys than girls, and is especially true for boys about four or five years old. It is during this period that masculine identification is occurring, and the presence of the

father is most important for the development of a well integrated personality. Reunion of the family may also adversely affect the children. During the separation, a child may actually almost lose the idea that he has a father. The father will become a stranger when he again enters the family circle. As such, he is usually viewed with mistrust and causes the child to be perplexed concerning his purpose. Because the child has mixed feelings toward his parents, he may be happy when the father who frustrated his desires left. When the father returns, however, he may feel guilty and fear retaliation for his secret triumph. The father who leaves when the child is an infant may himself be perplexed on reunion with his family when he finds he does not really feel like the child's father.

What can be done to alleviate some of these adjustment problems? The most important step in solving the innumerable marital adjustment problems which may arise when a physician enters the military service is to develop a realistic appreciation of the stresses which may be present. Just what may constitute a stress will, of course, vary with different individuals. He must, therefore, take a critical look at his own past emotional adjustment in situations of stress and general marital adjustment. This truthful review of his past will enable him to make some fairly accurate predictions of what he can expect.

A number of free discussions with his wife concerning their past and present attitudes and feelings will be helpful. Children should not be denied a similar opportunity to discuss their fears and wishes. Children should be told of anticipated changes in their living situation or separations from other members of the family as early as possible. An atmosphere which will enable all members of the family to talk freely about any confusions or feelings they have about such changes is a necessary prerequisite.

If marriage is being anticipated, much can be done to avoid later marital difficulties by giving considerable thought to the time of marriage and motives of marriage. During both World War II and the Korean Conflict, it became apparent that there is great need for caution in marriage just prior to entering the service. It is also not easy to try to understand the basic motives for marriage. If they involve a search for security in the face of impending service, be careful!

The role of letters as a means of maintaining contact must not be underrated. The value of this means of communication is mentioned in practically all papers and books dealing with personality adjustment during wartime. It is equally applicable to the physician and his family during peacetime. The emotional support of regular and frequent letters enables many couples to maintain a good adjustment. The success of these letters in maintaining emotional ties depends largely upon the individual's ability to put his feelings into words.

It must also be mentioned that letters may also cause misunderstandings. Even the professional writer cannot always be certain how his words

will be interpreted. A misunderstanding arising from such misinterpretations cannot be corrected as easily as verbal ones. Several days or longer may be necessary to clarify things. During this time, brooding and ruminations may tend to make settlement of the dispute even more difficult.

As soon as it is known that separation of husband from family is probable, some planning should start. Just prior to the separation, care should be taken that the wife is not forgotten. Relatives have a tendency to direct all their attention to the husband. The attitude toward the wife is "all she has to do is wait while he is the one who is leaving and going to suffer." Frequently, the result is that the wife suppresses her need for attention; guilt feelings or depression may then follow. Another variation of her rejection may result in anger which erupts with minor irritations.

On reunion of the family after separation, the father may help matters by a clear understanding of what is involved. He should not, for instance, be unduly disturbed by finding some reluctance on the part of his children to accept him. He should anticipate a necessary period of refamiliarization or "conditioning for fatherhood." He should only gradually reassume his authoritarian role as the head of the household.

Adjustment to the service can be facilitated by a clear understanding of the problems involved. This review of one's previous success in adjusting to change, and free communication between all members of the family is extremely valuable in the prevention of marital adjustment problems. (J. W. Burkett, M. D., Sepulveda, Calif.: The New Physician, 6: 41-54, April 1957)

* * * * *

Aspiration Before Injection of Dental Local Anesthetics

Among the reasons why aspiration is not universally practiced in dentistry, three should be examined thoughtfully and objectively: (1) It is evidently thought by some that when a needle point is in a blood vessel, blood will enter or can be "teased" into a nonaspirated cartridge; (2) So little has been said about this in the literature that many dentists believe the incidence of puncturing blood vessels is insignificant in dental injections; (3) The hazards of intravascular injection are not sufficiently appreciated by the profession.

This article presents some facts which bear on the first two of the aforementioned reasons and, hence, place the established ideas about the third reason in a different light.

Entrance of Blood in Nonaspirated Cartridge. To determine the circumstances in which blood will enter a cartridge in a nonaspirating syringe, some simple experiments were performed. The equipment consisted of colored water contained in a rubber tube which was under an easily regulated and accurately recordable pressure.

The frequency of penetration of the vascular bed during dental injections may be estimated from experience obtained at the Northwestern University Dental School Clinics where injections of local anesthetic solutions are given with all glass luer-type syringes. A table indicates the frequency.

Data in this table show that inadvertent intravascular injection may occur during any dental injection. Indeed, it is about twice as likely to occur during a zygomatic injection as during an infiltration, but it is unavoidable. Accuracy, skill, and experience in making injections will not alter these facts. Where there is living tissue, there is vascularity and the smaller branches are abundantly and randomly distributed.

What are the consequences of intravascular injection of a dental local anesthetic solution? The most obvious and, at the same time, the most innocuous is failure to obtain the anticipated local anesthesia. If the injection leaves the site promptly through a blood vessel, no anesthesia can be produced. Many dentists have commented on the high degree of coincidence between anesthetic failure and "untoward" reactions—presumptive evidence that intravascular injection had occurred.

Intravenous injection of local anesthetic solutions, on the other hand, is an invitation to disaster. Adriani has pointed out that systemic effects of local anesthetics occur only when the drug enters the circulation. In the usual situation of regional anesthesia, the drug enters the circulation slowly enough to create blood levels too low to produce systemic effects. When the drug enters the circulation fast enough, either by direct injection or by rapid exodus from the anesthetized region, systemic effects are manifest.

Sadove and co-workers classified the reactions to local anesthetics. These reactions may be due to stimulation of the central nervous system with symptoms varying in degree from verbosity to violent convulsions. Depression of the central nervous system with loss of consciousness and depression of the vasomotor and respiratory centers may occur without, or intermittently with, convulsions.

Peripheral effects may also occur independently of, or coincidentally with, the aforementioned reactions. There may be sudden peripheral vascular collapse or depression of cardiac activity or both. Uhley and Wilburne describe a "chaotic heart action" after administration of procaine.

The severity, duration, outcome, and sequelae to such episodes vary from trivial to fatal, the determining features being the relation between blood concentration and patient sensitivity as well as ability to withstand and recover from the insult. Such effects also may occur after extravascular injection, but only if the drug enters the circulation too rapidly. This may occur when no vasoconstrictor is employed or when its benefits are overcome by too rapid, too forceful, or too voluminous an injection.

One of the most insidious dangers in therapeutics is the complacency which develops when undesirable reactions are infrequent. With local anesthesia, this complacency is intensified by the knowledge that procaine is

given intravenously by intention in certain medical procedures. When this procedure is employed, the patient is hospitalized, recumbent, and emergency equipment and drugs are instantly available.

Three guiding facts indicate that deliberate aspiration should be practiced routinely before injection of dental local anesthetics. First, dental local anesthetic solutions injected intravascularly are a hazard to the patient, and on rare occasions, reach a lethal magnitude. Second, when the usual dental injections are practiced, the vascular bed will be entered about 32 times per 1000 injections. Third, unless the plunger of the injection syringe (or cartridge) is slightly but positively withdrawn, the presence of the needle in a blood vessel cannot be reliably known.

Aspiration takes a fraction of a second. At the time of this writing, aspirating cartridge syringes or the "Gabriel" luer-type syringe provide all the convenience of cartridges with the additional advantage of increased safety for the patient.

This procedure affords additional advantages to the dentist in fewer anesthetic failures, fewer anesthetic reactions, fewer frights, and opportunity to rinse the injection needles before sterilization. (Harris, S. C., Aspiration before Injection of Dental Local Anesthetics: J. Oral Surg., 15: 299-302, October 1957)

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Chronic Cystic Mastitis

Chronic cystic mastitis is a common disease of uncertain origin, puzzling pathogenesis, difficult diagnosis, and unsatisfactory treatment. It is often referred to as mammary dysplasia, fibroadenosis, cyclomastopathy, mastodynia, adenositis, fibrocystic disease, Bloodgood's blue-domed cysts, Schimmelbusch's disease, mazoplasia and a host of other complex and hybrid terms that have added chronicity to confusion.

The name, chronic cystic mastitis, is deplored as haphazard terminology by such distinguished pathologists as Foote and Stewart. Nevertheless, the present opinion of most doctors favors the term chronic cystic mastitis and—as noted by these authors—among some, it almost amounts to a "surgico-pathologic reflex." Those who prefer a more precise terminology usually base their diagnosis on the predominant pathologic picture, for rarely does chronic cystic mastitis consist of a pure or single histopathologic type of lesion. In many patients with this benign disease, the pathologic picture is representative in part of two or more types of abnormality.

Chronic cystic mastitis is neither neoplastic nor inflammatory. It probably represents an abnormality of breast tissue caused by an endocrine imbalance of the sex hormones. The mammary gland changes in a cyclic

fashion with normal ovarian activity. This relationship and hormone dependence is best illustrated by the development of the breast during puberty as well as by the striking mammary changes during pregnancy. Use of the sex hormones in the palliative treatment of advanced breast cancer seems to indicate a certain specific target-organ sensitivity. It seems fairly well established, therefore, that the secretion of estrogen and progesterone from the ovary, as well as prolactin from the pituitary, are responsible for the normal changes that occur in the breast, and that an imbalance of this hormone control may result in pathologic changes consistent with chronic cystic mastitis.

Chronic cystic mastitis does not ordinarily appear before puberty and usually does not occur spontaneously after the menopause. It is most likely caused by excessive estrogen stimulation.

The clinical diagnosis of chronic cystic mastitis is usually based upon a painful and nodular condition of the breast that must be carefully differentiated from malignancy and from inflammatory disease. This nodularity is usually accentuated in one breast, but is almost always bilateral. It often occurs during the later years of the child-bearing period. Pain is a common feature of this condition and is frequently accentuated during the premenstrual period. It is usually present in the upper and outer quadrant of the breast, commonly called the axillary tail of Spence. It is important for physicians to remember that a lump in the breast is not necessarily benign merely because it is painful. Between 25 and 50% of all breast cancers cause some discomfort during the course of the disease.

The over all complex of chronic cystic mastitis may include a single gross cyst, a cluster of macroscopic cysts with or without fibroepithelial proliferation, or an area of adenosis. There is frequently a palpable lump that may be indistinguishable from carcinoma. These dominant and discrete benign breast tumors may reveal many of the cardinal signs and symptoms of breast cancer.

Most often, however, chronic cystic mastitis is a diffuse disease with bilateral areas of nodularity and shottiness. These may vary in size and consistency, especially during the menstrual cycle, and in a small number of cases may even disappear. Solitary cysts are usually firm but not hard. Except when they are located in the subareolar region, they are usually freely movable without the physical signs of retraction. However, tense and thick-walled cysts that are deeply situated within the breast give the misleading impression of a stony-hard solid tumor and are frequently mistaken for carcinoma. Nipple secretion, if present, is usually of the serous or milky type. However, the differential diagnosis between cancer and chronic cystic mastitis is seldom greatly aided by the routine use of a Papanicolaou smear of nipple secretion.

The treatment of chronic cystic mastitis is highly varied, often empiric, and generally far from satisfactory. In younger patients with

diffuse disease, where mastodynia is the major problem and the likelihood of cancer but a minor risk, conservative measures are certainly to be regarded as the treatment of choice. Simple reassurance is the first and foremost factor in providing for a patient's well-being.

If conservative care is to be recommended, it must be done with great caution and as a carefully calculated risk. All patients in whom "watchful waiting" is to be advised are to be encouraged to practice breast self examination regularly once a month just after the menstrual period. Routine follow-up visits are then required at periodic intervals. Even slightly suspicious lesions must be reexamined immediately after the next menstrual period.

Complete local excision, whenever possible, is the treatment of choice in chronic cystic mastitis. As suggested by Bloodgood many years ago, simple mastectomy is too radical a procedure for benign breast disease and too conservative a procedure for malignant breast disease. However, certain patients in the older age group with a very diffuse cystic disease or those patients having recurrent lesions with a distinct premalignant potential may best be treated by simple mastectomy. Nevertheless, in most cases where simple mastectomy has been performed, simple excision probably would have sufficed.

Despite a wide local excision, it has been universally observed that recurrent chronic cystic mastitis will develop in either the same breast or the opposite breast in about 15% of the patients. (Lewison, E. F., Chronic Cystic Mastitis: G. P., XVI: 97-101, October 1957)

* * * * *

Tuberculin Converters

Should, or should not primary tuberculosis be treated? Answers to this question have gone from one extreme that all of them should have preventorium care, to the other extreme, that none of them should be treated because those who had sanatorium care did no better than those who had none. Now that antituberculous drugs of relatively low toxicity are available, this same question has come up again. Whether primary tuberculosis should be treated depends upon the natural history of the disease; this history is determined by the age at which the patient has primary tuberculosis. The age group, 2 years and under, has a high incidence of serious complications, particularly tuberculous meningitis; the age group from 5 to 9 years has very few complications from hematogenous spread of primary disease; the age group after puberty develops reinfection type pulmonary tuberculosis with the disease starting earlier in girls than in boys.

This question is asked most frequently by pediatricians and the author believes that an answer is due, because out of 330 consecutive admissions

to the Central Washington Tuberculosis Hospital with proven tuberculosis (proved by positive culture or pathology), only 7% were under 6 years of age, yet 56% of the tuberculosis deaths occurred in this group.

Most physicians think of primary tuberculosis as a localized disease manifest by a Ghon complex; this is definitely not so because, almost certainly, there is hematogenous dissemination in all cases as manifested by:

1. The presence of small calcified tubercles in the spleen; calcified lymph nodes in the neck and abdomen as seen on x-ray film or at autopsy.
2. Late complications of bone; renal and cervical adenitis.
3. Positive cultures of bone marrow as well as positive gastric washings in over 20% of patients.
4. The fact that BCG organisms grown in radioactive phosphorous become radioactive, and when a person with a negative tuberculin is vaccinated with these radioactive organisms, it is possible to demonstrate radioactivity throughout the body within a few hours. If this occurs with an attenuated bacteria in the skin, then certainly it must occur with a virulent organism in the lung.

The object of giving antituberculous drugs is to sterilize the lesions already present. But there is no drug known today that will do this in an animal, even if the drug is started at the time the animal is infected. By the time the skin test has converted, the person already has caseous foci within the body, and streptomycin penetrates caseous material poorly; isoniazid is not effective in an area with low oxygen concentration such as these caseous areas. Unless tubercle bacilli are actively multiplying, none of these antituberculous drugs have any effect on them. The fact that some children have had a conversion of skin test from positive back to negative while taking isoniazid is no indication that all the tubercle bacilli are dead.

The theoretical immunological value of a positive skin test is also questionable because of those who acquired a primary infection from exposure—when followed for a long period of time (5 to 20 years)—a significant number developed reinfection type tuberculosis.

The author covers what antituberculous drugs will not do in the treatment of primary tuberculosis then discusses their beneficial effects. First, in his experience, in treating well over 100 children since 1952, using streptomycin, isoniazid, and para-aminosalicylic acid, he has seen no new tuberculous complications after starting drug therapy. For example, no child admitted with miliary tuberculosis and normal spinal fluid has developed meningitis; no child with bone tuberculosis has developed meningitis even though fused early in the course of the disease. The children in this series received an average of 220 days of combined drug therapy. The only cases receiving a year of drug therapy are those with tuberculous meningitis. Thus, the complications that occur as a result of hematogenous spread of primary

tuberculosis can be prevented with a much shorter period of treatment than is recommended by Lincoln. Combined drug therapy prevents new complications from hematogeneous spread. Because reinfection type tuberculosis occurs after puberty and several years of follow-up are needed from the time of conversion of skin test to the breakdown with reinfection type disease, no physician has a group of cases large enough to provide information about the effectiveness of antituberculous drugs in preventing this reinfection type disease.

Before deciding to treat all cases with a positive skin test, the toxic manifestations of the drugs must be weighed against their known beneficial effects. PAS usually has a low toxicity in children, yet the author has recently seen a child with a severe reaction. Isoniazid also produces few acute toxic reactions, yet continued use of this drug may not be as harmless as physicians have been led to believe.

The five children who died of tuberculous meningitis varied in age from 14 months to 5 years; four were under 3 years old. If these children could have been treated when their skin tests converted, their deaths could have been prevented. However, the author did not learn the source of their infection or that their tissues were sensitized until they were admitted to the Washington Tuberculosis Hospital. The tragic fact about these children is that they were all in general hospitals for an average of 20 days without specific therapy before the diagnosis of tuberculous meningitis was considered, and skin tests had not been done until just before admission to the Washington Tuberculosis Hospital. Before specific drug therapy became available, life expectancy of a child with tuberculous meningitis was 4 to 6 weeks from the time he became sick enough to see a physician to the time of death. Thus, the disease had almost run its course when these moribund children were started on specific treatment. In these cases, the author had no opportunity to treat them as recent skin test converters nor to treat them early in their terminal tuberculous complications. Physicians have been lulled to sleep by the fall in death rate. They do not realize that the number of new cases each year and the extent of the disease have not changed, and that serious tuberculous disease still occurs in children. (Allen, A. R., Should We Treat Tuberculin Converters? Dis. Chest, XXXII: 441-443, October 1957)

* * * * *

M. D. USN - A New Film Release

MD-USN, the Medical Department's new motion picture to be used in the Officer Procurement Program has just been released. The Bureau announces that prints will be ready for distribution during December.

MD-USN is a 43-minute survey of a career in Navy medicine as exemplified by the experiences of one Medical officer whose life as he himself

says may be called average or typical. Doctor Haney shows the audience the high spots—and the low ones—in the first several years of his naval medical career and tells why he has decided to stay in the Navy.

He is followed from the beginning of internship through residency and surgical service and from Philadelphia to Naples to Yokosuka with a number of stops between.

Doctor Haney's pictorial story is complemented by live dialogue and his own narration. Its emphasis is on the high quality of medical training in the Navy and the variety of challenging opportunities in naval medical practice. These broad subjects are specifically illustrated in scenes at naval hospitals and research centers both stateside and overseas, and aboard Doctor Haney's ship during a tour of sea duty.

Although the professional aspects of the life are emphasized, the picture is still very much Doctor Haney's personal story; we go to his wedding, we visit the couple at home in various quarters here and abroad as his career progresses. We see them together in Europe during part of his Mediterranean cruise. We meet some of their friends, and we're not far from the OB clinic in San Diego when their child is born. Throughout the film we share Haney's interest in Navy medicine—and, on occasion, his doubts about it. In short, we are intimate witness to a considerable span in the life of a thoughtful and articulate young man.

Actors play the parts of Doctor and Mrs. Haney and one or two supporting characters. All others in the film are Navy personnel, portraying their own roles in Service life. They include the Surgeon General, a number of his Division Heads in the Bureau, Medical Corps officers in hospitals and aboard ship, Nurse Corps officers, and many Hospital Corpsmen both ashore and afloat.

Principal photography for MD-USN was done on location at New York City, Philadelphia, Washington, and Norfolk; special additional footage was shot in Italy and Japan.

The Bureau's plan for principal utilization of the film is to have it shown at medical colleges by Naval Medical officers who will also distribute associated literature and hold discussions with students about a Naval Medical career. Prints will also be distributed throughout the naval districts and to naval hospitals so they will be available to a wide audience. If a print is not available through this distribution for your particular screening schedule, address inquiry to Film Distribution Unit, Training Division, Bureau of Naval Personnel, Department of the Navy, Washington 25, D. C. (Audio-Visual Training, BuMed)

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The printing of this publication was approved by the Director of the Bureau of the Budget, 16 May 1955.

American Board of Obstetrics and Gynecology

The Part I Examinations of the American Board of Obstetrics and Gynecology are to be held in various parts of the United States and Canada, Thursday, 2 January 1958, at 2:00 p. m.

Candidates notified of their eligibility to participate in Part I must submit their case abstracts within thirty days of notification of eligibility. No candidate may take the written examination unless the case abstracts have been received in the office of the Secretary.

Current bulletins outlining present requirements may be obtained by writing to the Secretary's office.

Robert L. Faulkner, M. D.

Secretary-Treasurer

American Board of Obstetrics and Gynecology

2105 Adelbert Road

Cleveland 6, Ohio

(ProfDiv, BuMed)

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From the Note Book

1. Rear Admiral B. W. Hogan, Surgeon General of the Navy, was the principal speaker at the premier showing of MD-USN, a professional orientation film depicting the first several years in the life of a Naval Medical officer, at the National Naval Medical Center, Bethesda, Md., on October 22, 1957. (TIO, BuMed) (See page 15)
2. Captain B. H. Smith Jr., MC USN, Director of Laboratories, USNH, Philadelphia, Pa., has been appointed Assistant Professor of Pathology at Temple University School of Medicine. (USNH, Phila., Pa.)
3. Colonel Charles R. Mueller, MC USA (Ret), who for the past year has been the First Vice President of the Association of Military Surgeons of the United States, was installed as President of the Association at the annual meeting of the Association held in Washington, D. C.
4. CDR Bruce F. Baisch MC USN, a member of the surgical staff of the U. S. N. H., Philadelphia, Pa., was initiated as a Fellow in the American College of Surgeons, 18 October 1957. (USNH, Phila., Pa.)
5. The U. S. Naval Dental School, National Naval Medical Center, Bethesda, Md., began the second series of commemorative lectures honoring the professional achievements and outstanding services of distinguished deceased

Navy Dental officers October 24, 1957. The first lecture of this series honored the memory of Vice Admiral Alexander G. Lyle, Dental Corps, U. S. Navy. (TIO, BuMed)

6. During the calendar year 1956, there were 131,763 cases of syphilis in all stages reported in the continental United States. This represents an increase of 7.1% over the 123,004 cases reported a year earlier and is the first year since 1946 that the number of reported syphilis cases exceeded the number reported during the previous year. Included in the above total were 26,598 cases of early syphilis (primary, secondary, and early latent) which is a slight increase over the number of cases in this category during the previous year. The 233,593 cases of gonorrhea reported represent a decline of 4.4% from the 244,279 cases reported a year earlier.

7. Surgical mobilization of the ankylosed stapes has sound rationale behind it in that it attacks directly the pathologic process responsible for otosclerotic deafness. It is not a substitute for the fenestration operation and comparison of the two procedures is not valid. (Arch. Otolaryngol., October 1957; L. W. Alexander, M.D.)

8. The best approach to the treatment of anemia is to appraise each case from the standpoint of the physiologic cause involved and then to direct therapy to correct the pathologic effect. There is no therapeutic agent that can replace a careful, thoughtful physician in the treatment of anemia. More anemias are cured by correcting the basic pathologic physiology than by an expensive hematinic barrage. (GP, October 1957; J. W. Frost, M.D., M. I. Goldwein, M.D.)

9. The administration of certain therapeutic agents may be complicated by the development or reactivation of peptic ulcer, with hemorrhage and perforation. The mechanisms involved are not completely understood, but undoubtedly include stimulation of gastric secretion and decrease in the resistance of the gastroduodenal mucosa locally. (Ann. Int. Med., October 1957; J. B. Kirsner, M.D.)

10. This report, which reaffirms the observation that the most marked variations from the normal pattern to be found in ballistocardiography are those exhibited by individuals suffering from coronary artery disease and accompanying myocardial damage, deals with impressions formed after reviewing over 400 ballistocardiograms. (Dis. Chest, October 1957; W. M. Rosenblatt, M.D.)

11. A series of 214 herniorrhaphies performed on elderly patients is reported. From the results, the conclusion is drawn that with the extended life expectancy patients should not be denied the benefits of elective surgical repair of such conditions as hernia on the basis of age alone. (Post Grad. Med., October 1957; A. M. Vaughn, M. S. White)

12. This article reports the result of a survey of 3637 peridural blocks performed on 3554 patients both for surgical and obstetrical anesthesia and as an aid in the diagnosis and therapy of disease. (Anesthesiology, September - October 1957; J. J. Bonica, Md., et al)

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Board Certifications

American Board of Anesthesiology

LTJG William E. Giertz (MC) USNR (Inactive)

American Board of Ophthalmology

LT William M. McCarty (MC) USNR (Inactive)

LCDR Robert A. Neely (MC) USNR (Inactive)

LCDR Robert H. Palmer (MC) USN

American Board of Physical Medicine and Rehabilitation

LTJG Robert V. Miller, Jr. (MC) USNR (Inactive)

American Board of Preventive Medicine

CAPT Harold E. Gillespie (MC) USN

American Board of Radiology

LCDR Deck E. Chandler (MC) USN (Nuclear Medicine)

LT Robert E. Sandy (MC) USNR (Active)

American Board of Surgery

LT George G. Graham (MC) USNR (Inactive)

LT Charles N. Peabody (MC) USNR (Inactive)

American Board of Urology

LCDR Harold E. Eggers (MC) USNR (Inactive)

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BUMED NOTICE 6230

22 October 1957

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations

Subj: Ch-1 to BuMed Instruction 6230.8B, Subj: Poliomyelitis
Vaccine

Encl: (1) Replacement pages 3 and 4 of BuMedInst 6230.8B

This notice transmits revised paragraphs 4d, 4e, 5, and 6 to BuMed Instruction 6230.8B. AlNav 17, BuMed Notice 6230, 8 May 1957 is canceled.

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BUMED NOTICE 6010

31 October 1957

From: Chief, Bureau of Medicine and Surgery
To: All Naval Hospitals, National Naval Medical Center, Bethesda, Md., and the Aviation Medical Center, Pensacola, Fla.

Subj: Facilities for In and Out Patient Services to dependents of
Military personnel, maintenance, and operation of

This notice invites attention to the need for providing the best possible medical facilities and services to dependents of military personnel.

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BUMED NOTICE 6320

5 November 1957

From: Chief, Bureau of Medicine and Surgery
To: All Naval Medical Activities Providing Inpatient Care

Subj: Register of Patients, DD Form 739

Ref: (a) Arts 23-215, 23-216A, and 23-222, ManMed

This notice advises addressees that the Register of Patients Form DD-739 will replace all military departmental or lower echelon forms used for this function upon depletion of present supplies of such forms.

The new form is available from appropriate forms and publications supply points upon requisition.

SUBMARINE MEDICINE SECTION



Embolism Due to Air and Other Gases

That gas embolism is much more common than is generally recognized is the conclusion reached by Doctors Durant and Oppenheimer of Temple University School of Medicine on the basis of discussions with physicians from all parts of the country. The true incidence can never be deduced from the literature because many cases are not reported—even if recognized. The increasing complexity of diagnostic and therapeutic procedures of recent times has led to an increasing number of such accidents.

For purposes of clarity, gas embolism is classified by the site of lodgement. Thus, pulmonary gas embolism indicates the situation where gas enters the systemic veins and is carried to the right heart and pulmonary arterial circulation. Arterial gas embolism is the case when the gas enters the pulmonary veins and is carried to the left heart and systemic arteries. There is, in addition, a mixed form in which gas which has entered systemic veins not only obstructs the pulmonary circulation, but also, by causing a rise in pressure in the right heart, shunts gas through a septal defect into the left heart to the systemic arteries.

Etiology. Gas may be swept into the circulation in any circumstances when the lumen of a venous channel is exposed to a quantity of gas under pressure greater than that in the vein, provided the vein does not collapse due to larger outside pressures. Embolic manifestations will become evident if the quantity of gas gaining entry into the circulation is large enough. The pressure within the vein when exposed to gas is of considerable importance. During operations done in the sitting position there is a highly negative pressure, especially during inspiration, within the veins of the head, neck, and axilla when above the level of the heart. A similar postural relationship exists in gynecological operations performed with the patient in the Trendelenberg position or the knee-chest position. For these reasons the subject of gas embolism is of particular importance to neurosurgeons and gynecologists. Deaths from this cause have occurred during neurosurgical procedures, tubal insufflation with air (Rubin test), but not when carbon dioxide is used, use of powder blowers in treating vaginitis, deliveries when the knee-chest position is used, douching, delivery of placenta previa, and are associated with criminal abortions. Insufflation of air perirennally has almost been abandoned because of this hazard. Substituting

oxygen for air in this procedure—though less dangerous—is not to be regarded as safe. Any diagnostic or therapeutic injection of air is potentially dangerous in this respect.

Pathophysiology. It is probable that air bubbles do not pass into vessels of less than 30-40 microns in diameter. Bubbles of this size act more like plastic solids than viscous liquids. The surface tension of bubbles of this size is such that there is little likelihood of their breaking into smaller bubbles. This same thing is pretty much true for oxygen bubbles as well as for air bubbles, because the solubility of the two is not greatly different. Because air is irritant to the vessel walls, an added influence of air may be spasm distal to the obstruction.

Pulmonary Gas Embolism. The results of pulmonary gas embolism have been summarized on the basis of studies in dogs as follows:

A. Circulatory Effects

1. Abrupt rise in pulmonary arterial pressure
2. Equally abrupt fall in systemic arterial pressure
3. Extrasystolic arrhythmia, predominantly bigeminal
4. Right ventricular dilatation, and (with large doses of gas) ischemia of the right ventricular myocardium, plus right ventricular failure manifest by an abrupt rise in systemic central venous pressure
5. Elevation in right atrial and right ventricular pressures

B. Respiratory Effects

1. Initial short period of polypnea or hyperpnea, followed by
2. A brief period of apnea, followed by
3. A prolonged period of polypnea continuing to recovery in surviving animals or lapsing again into apnea in those that succumb.

Small doses (1 cc/kg) produce transient effects with recovery following rapidly. Large, usually fatal, doses (7.5 cc/kg) in the supine animal result in air being trapped in the right heart. Blood flow continues in this circumstance until the entire chamber is filled. In assessing the various effects they conclude that the circulatory and respiratory disturbances associated with pulmonary gas embolism are dependent both on reflex and mechanical factors.

Factors in Mortality. The following factors are known to be of significance in the outcome in cases of gas embolism.

1. Amount of gas entering the systemic circulation
2. Rate of injection or aspiration of the gas
3. Pressure of the gas

4. Kind of gas (air, oxygen, carbon dioxide, et cetera)
5. Body position of the victim
6. Preexisting efficiency of the victim's circulatory and respiratory systems

The speed with which a fatal dose (volume) of gas finds entrance to the blood stream is undoubtedly the most important consideration. When the injection is made slowly, a considerably larger volume can be tolerated. The pressure of the gas is a factor in the rate of injection. Dog experiments have shown that the majority will not survive a dose of 7-8 cc of air per kilogram of body weight. Posture influences survival. Twice as many animals in the left lateral position survived as did those in the supine position. The right lateral position offered the least chance of survival. The left lateral position traps air away from the outflow tract.

Oxygen and air behave much the same when they are gas emboli. However, carbon dioxide which is 20 times as soluble as air is extremely well tolerated. This quality which makes it safer also makes it less desirable for some procedures.

Clinical Picture. Onset is abrupt, usually during or soon after a procedure with which gas embolism might be suspected. Nausea, dizziness, pain in the thorax, or a sense of suffocation may precede loss of consciousness. Cough may be a preliminary sign. A surgeon may hear the sucking sound of aspiration. Initial pallor is rapidly replaced by cyanosis. Generalized convulsions and urinary incontinence may occur. Pulse and blood pressure may be unobtainable very soon. A characteristic "millwheel murmur" is often heard and frequently may be heard at some distance from the patient. It should not be confused with the crunching sound of mediastinal emphysema. The presence of "millwheel murmur" is diagnostic, but its absence does not rule out pulmonary gas embolism. The electrocardiogram may indicate myocardial ischemia or right heart strain. Respiratory irregularity or apnea are almost always present. The course is usually rapid either to recovery or to death.

Treatment. Treatment begins with prevention. This means care to avoid the entrance of air into venous channels during surgical procedures and intravenous injections. Vaginal insufflation should not employ a tight fitting cuff. Carbon dioxide should be used in conducting the Rubin test. The authors consider the hazard so real with perirenal insufflation as to contraindicate its use and its replacement by the presacral technique which is relatively less hazardous. Pneumoperitoneum—although not entirely free of the hazard—is safer when only the left side is used.

Once the casualty has occurred, treatment is based on (1) positioning of the patient, (2) artificial respiration, (3) oxygen, and (4) aspiration of the heart (if other measures fail). There is both experimental and clinical evidence to indicate that the left lateral position enhances survival probability.

Artificial respiration is indicated because this casualty is characterized by primary respiratory failure. It should be carried out by a method which does not prevent the left lateral position. Oxygen administration appears logical wherever artificial resuscitation is indicated. Aspiration of the right heart should be resorted to if other efforts have been futile. The needle should be placed in the highest portion, but any case requiring this measure is likely to be one in which the entire cavity contains air and will be helped if any appreciable amount of air can be aspirated.

Arterial air embolism. While large quantities of air can be injected slowly into the systemic veins of animals without harm, as little as 0.5 to 1.0 cc of air injected into the left heart or carotid artery could be fatal. Although the casualties associated with this circumstance have been recognized for years, it was not until in the 1930s that they were associated on a cause and effect basis.

Etiology. Most reported cases are associated with either thoracocentesis or some surgical procedure on the thorax. Air already present in the thoracic cavity may be an important source of such accidents when access to the venous system exists and there is sufficient pressure gradient from source to vein. During pneumothorax therapy, it is possible for air to reach the venous system directly by being injected, or indirectly through a pleurovenous fistula as a result of the combination of increased pressure and a tear in the tissues. Alveolar air embolism also occurs by this indirect mechanism when the pressure of alveolar air is not compensated with changes in ambient pressure. This can also occur in connection with explosive decompression of pressurized aircraft cabins, in submarine escape procedures, and as a casualty resulting from improper diving technique. It is speculated that this passes unrecognized fairly often in connection with sport diving. Decompression sickness—sometimes called caisson disease—may cause bubbles to appear in the venous circulation, but the cause here is not the same as the one involved above. Decompression sickness results from the gas in solution forming bubbles when it comes out of physical solution as a result of inadequate decompression following exposure to elevated air pressures, as in diving or caisson work.

Once a bubble appears in the pulmonary vein—regardless of the source—it is carried to the left heart and on into the aorta. From the aorta its destination is in a large measure determined by the posture of the patient.

Clinical Features. The onset of arterial air embolism is usually sudden. Sometimes there are warning symptoms, such as dizziness, faintness, or patient says he "feels funny." Rarely, there may be complaint of pain or a sense of impending death. Unconsciousness usually follows any warning symptoms. Disorientation or convulsions may occur. Localized neurological manifestations generally are noted following return of consciousness and may be any of the following: hemiplegia, hemiparesis, hemianesthesia, monoplegia, hemianopsia, nystagmus, or strabismus.

Blindness may be complete and even without loss of consciousness. Cheyne-Stokes respiration and evidence of peripheral vascular collapse may be evident. The heart may be noisy, but never shows the "millwheel murmurs" as heard in cases of pulmonary gas embolism.

Pathognomonic Signs. The signs which may be considered pathognomonic of arterial air embolism are: (1) visualization of air bubbles streaming through the retinal vessels on ophthalmoscopic examination; (2) Liebermeister's sign—a sharply defined area of pallor in the tongue; (3) marbling of the skin; (4) air bleeding—the observance of air bubbles in bleeding from a small skin incision made in the most superior portion of the body; and (5) the roentgenologic demonstration of air in the cerebral vessels.

Treatment. Treatment, here too, begins with prevention. It is even more important with arterial gas embolism than with pulmonary gas embolism. Once arterial gas embolism has occurred, the patient should be placed immediately in a head down position with the trunk halfway between the prone and left lateral positions. This will minimize the chances of further introduction of gas emboli into the cerebral or coronary vessels. Additional measures are artificial respiration, administration of oxygen, and treatment of shock. During cardiac or thoracic surgery, it may be helpful to clamp off the aorta and apply manual systole. Experimental work suggests that air in the coronaries is not necessarily irreversible. (Durant, T. M., Oppenheimer, M. J., Veterans Administration Medical Bulletin, MB-1, dated July 16, 1957)

Added Comment

Arterial gas embolism when seen as a submarine escape or diving casualty is generally characterized by sudden loss of consciousness just before or very soon after surfacing. Although not mentioned in the article, nor is it generally available, recompression is the most important single treatment procedure. This point is so important that if recompression facilities are available within a reasonable time lapse, it is worth trying to take the patient to the recompression chamber. Obviously, this will pose special problems when the event occurs during a surgical procedure. However, arterial air embolism is regarded as such a likely diagnosis and the consequences are so serious that whenever a diver surfaces in an unconscious condition or loses consciousness shortly after surfacing, this is sufficient of itself to justify recompression. When indicated, artificial respiration and oxygen administration should be started immediately and continued during transport and recompression until the patient is most certainly beyond restoration.

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RESERVE SECTION

Promotion Point Credit for Extended Active Duty in Reserve Corps

Promotion points are creditable for extended active duty as follows:

A. For each month of extended active duty (not including training duty) subsequent to 30 June 1955: Two promotion points.

B. For each month of extended active duty (not including training duty) between 1 July 1950 and 1 July 1955: One promotion point.

Extended active duty includes temporary active duty which is intended to be and does exceed 30 days. It does not include special training duty in excess of 30 days.

The number of months creditable is calculated from calendar day of entry on active duty to calendar day of release from active duty. A fraction of a month of 15 days or more is creditable as a whole month.

Officers initially commissioned on active duty will be credited with points in their new grade from date of rank in the new grade.

Officers promoted while on active duty will be credited with points in their new grade from date of rank in the new grade.

Promotion points for active duty between 1 July 1955 and 30 June 1957 are creditable as of 1 July 1957.

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Promotion Point Credit for Active Duty for Training, Appropriate Duty, and Drill Participation

Twelve promotion points are creditable for each fiscal year since 30 June 1949 in which participation in present grade in the Naval Reserve was at the following minimum levels:

A. Fiscal Year 1958 and Subsequently (Effective 1 July 1957):

Points are creditable for meeting the participation requirement of either subparagraph 1. or 2. below:

1. Completion of 14 days active duty, active duty for training, and/or periods of appropriate duty, or

2. Attendance at 75% of the drills prescribed (48 or 24 drills) in the table of organization for the unit or units in which enrolled, but

in no case fewer than 18 drills. Drills attended as an instructor in a Naval Reserve officer school are included. Drills attended as a student in a Naval Reserve officer school are not included.

(a) The number of drills attended is the number reported on Quarterly Naval Reserve Drill Reports (NavPers 1259).

(b) An officer's percentage of attendance is determined by dividing the total number of drills attended by the total number of drills prescribed for the quarters in which the officer is enrolled. If an officer is enrolled in more than one unit during a year, the divisor in this computation is computed by multiplying the total number of quarters in which he was enrolled by the number of drills prescribed per quarter for the unit having the least number of prescribed drills.

B. Fiscal Years 1956 and 1957 (1 July 1955 through 30 June 1957): Minimum participation requirements were the same as in paragraph A above, except for the following:

1. The minimum number of drills was 12 instead of 18.
2. Drills attended as either an instructor or a student in a Naval Reserve officer school course were included in drill attendance.

C. Fiscal Years 1950 through 1955 (1 July 1949 through 30 June 1955): Completion of the requirements for a year of satisfactory Federal service through accrual of 50 retirement points, provided that at least 12 of the retirement points were earned by active duty, active duty for training, drills, or appropriate duty. For officers having anniversary years other than the fiscal year, the 12 points in fiscal 1955 were creditable for the portion of a year between anniversary date and 30 June 1955, provided that in that period at least 50 retirement points were accrued, at least 12 of which were earned by active duty, active duty for training, or appropriate duty.

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Policy

The U. S. Navy Medical News Letter, is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

DENTAL**SECTION****Diamond Abrasive Instruments**

Numerous complaints have been received by the Materiel Division, Bureau of Medicine and Surgery, regarding all brands and types of diamond abrasive instruments currently cataloged in the Medical Stock List. The following information is provided to acquaint Dental officers and auxiliary personnel with the problems involved in the testing and procurement of these items.

Diamond abrasive instruments are fabricated by a process of electroplating or electrodeposition of bort (diamond fragments) on a matrix. Variation in quality is inherent in this manufacturing process; no satisfactory nondestructive test for quality has been developed. Government agencies are working with industry to develop standards for diamond instruments. In the interim, every possible effort is being made to provide a product of acceptable quality. The steps being taken include improvement of specifications, close liaison with industry to improve manufacturing processes, and inspection by Government inspectors.

Until such time as improved manufacturing processes and acceptable and uniform methods of testing are developed, considerable variation in the quality of diamond instruments can be expected.

Instructions outlining the care and cleaning of diamond instruments are furnished with each unit package and should be followed to maintain the efficiency and prolong the useful life of these items.

* * * * *

Spare Parts for Highspeed Conversion Material

BuMed Notice 6750 of 2 August 1957 announced continuation in fiscal year 1958 of the program to convert dental operating units to higher speed operation and authorized the replacement of consumable items which were previously procured under this program that are worn out through use.

In order to conserve funds and material, it is mandatory that items, such as highspeed handpieces which require only spare parts to keep them

in operating condition should not be replaced, but should be repaired if economically feasible under the Medical and Dental Equipment Maintenance and Repair Program (BuMed Instruction 6700.1 of 2 February 1953). Repair parts cannot be procured under the Special Dental Conversion Program administered by the Field Branch, Bureau of Medicine and Surgery, but must be financed out of local funds.

Handpieces and associated conversion materials of the same manufacture should be utilized as much as possible within each activity. Accordingly, the Bureau ordinarily will not, without adequate justification, approve requisitions for additional conversion material which indicate that more than one method of conversion is being utilized at an individual activity.

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Navy Enlisted Classifications Reporting

Many dental activities are erroneously reporting Group XI Navy Enlisted Classification Codes on the DD Form 477a (Dental Service Report).

Attention is invited to BuPers Instruction 1220.9A; BuMed Instruction 1220.1; and NavPers 15105A, Manual of Navy Enlisted Classifications, for instructions for the recoding of dental technician ratings.

Dental technicians who have completed only the Class "A" (Basic) school will be assigned the NEC DT-0000. The following codes are assigned upon satisfactory completion of the school or course indicated.

- DT-8703 - Advanced General (Class B)
- DT-8713 - Clinical Laboratory (Class C)
- DT-8714 - Dental Research Course at NMRI, Bethesda
- DT-8722 - Medical Administration (Class C)
- DT-8732 - Dental Repair (Class C)
- DT-8752 - Dental Prosthetic (Class C)
- DT-8753 - Advanced Prosthetic (Class B)
- DT-8765 - Maxillofacial Course at NDS, Bethesda

Particular attention is invited to the fact that the codes of dental technician ratings may be assigned or revoked only by specific authority of the Chief, Bureau of Medicine and Surgery.

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BUMED INSTRUCTION 1510.2B - Training Available to Group XI, Dental Ratings. This instruction promulgates information on training available to Group XI, Dental Ratings and supplements, NavMed P-5029, Catalog of Dental Technician Schools and Courses (1955).

BUMED INSTRUCTION 6820.4E - Professional Medical, Dental, and Technical Books and Publications; requirements for and procurement of. This instruction lists the minimal requirements for reference libraries and informs addressees of the procedure to be followed in the procurement of professional medical, dental, and technical books and publications.

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BUMED NOTICE 6150 - DD Form 877 (Request for Medical/Dental Records. This notice advises that the DD Form 877 (Request for Medical/Dental Records) has been standardized by the Department of Defense for use by three services.

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PREVENTIVE MEDICINE SECTION

Excessive Cigarette Smoking

The Public Health Service is, of course, concerned with broad factors which substantially affect the health of the American people. The Service also has a responsibility to bring health facts to the attention of the health professions and the public.

In June 1956, units of the Public Health Service joined with two private voluntary health organizations to establish a scientific Study Group to appraise the available data on smoking and health. The report of this Study Group and other recent data, including the report of Doctor E. C. Hammond and Doctor Daniel Horn on June 5, 1957 to the American Medical Association in New York, have been reviewed.

In the light of these studies, it is clear that there is an increasing and consistent body of evidence that excessive cigarette smoking is one of the causative factors in lung cancer.

The Study Group, appraising 18 independent studies, reported that lung cancer occurs much more frequently among cigarette smokers than among nonsmokers; that there is a direct relationship between the incidence of lung cancer and the amount smoked. This finding was reinforced by the more recent report by Doctors Hammond and Horn.

Many independent studies have thus confirmed beyond reasonable doubt that there is a high degree of statistical association between lung cancer and heavy and prolonged cigarette smoking.

Such evidence is largely epidemiological in nature. It should be noted, however, that many important public health advances in the past have been developed upon the basis of statistical or epidemiological information.

The Study Group also reported that in laboratory studies on animals at least five independent investigators have produced malignancies by tobacco smoke condensates. It also reported that biological changes similar to those which take place in the genesis of cancer have been observed in the lungs of heavy smokers. Thus, some laboratory and biological data provide contributory evidence to support the concept that excessive smoking is one of the causative factors in the increasing incidence of lung cancer.

At the same time, it is clear that heavy and prolonged cigarette smoking is not the only cause of lung cancer. Lung cancer occurs among nonsmokers, and the incidence of lung cancer among various population groups does not always coincide with the amount of cigarette smoking.

The precise nature of the factors in heavy and prolonged cigarette smoking which can cause lung cancer is not known. The Public Health Service supports the recommendation of the Study Group that more research is needed to identify, isolate, and try to eliminate the factors in excessive cigarette smoking which can cause cancer.

The Service also supports the recommendation that more research is needed into the role of air pollution and other factors which may also be causes of lung cancer in man.

While there are naturally differences of opinion in interpreting the data on lung cancer and cigarette smoking, the Public Health Service feels the weight of the evidence is increasingly pointing in one direction: that excessive smoking is one of the causative factors in lung cancer. (Excerpt from a statement by Surgeon General Leroy E. Burney, Public Health Reports, 72: 786, September 1957)

* * * * *

A New Wheel-Mounted Insecticide Mist Sprayer

Development of a new wheel-mounted insecticide mist sprayer which also can be carried in a vehicle, such as a jeep or light truck, has been announced by the U. S. Army Corps of Engineers' Research and Development Laboratories, Fort Belvoir, Va.

Primarily for use by military activities in normal insect control operations, the sprayer also is of use in many civilian capacities. It can be used for quick knock-down of flying insects at open air theaters and other such gatherings as well as around dairy barns, stockyards, garbage dumps, sewage plants, and summer camps.

The sprayer consists essentially of a gasoline engine, air compressor, insecticide pump, and an insecticide tank all mounted on a common base, two-wheel push cart chassis, and may be pushed manually into or through areas for insecticidal purposes. In large areas or where the terrain is too difficult for push cart movement, the sprayer is readily removed from the wheeled chassis and can be carried in a vehicle. As base-mounted equipment, it weighs 140 pounds; with wheeled chassis and 5 gallons of insecticide spray, the over all weight is 210 pounds.

The versatility of the sprayer was improved for field use by adding several accessories to permit dispersal of insecticide dust and indoor liquid residual spraying. A standard dusting gun developed for use with a personnel delousing unit was adapted for quick connection to the compressed air line of the unit. A spray bottle assembly consisting of a one-quart plastic bottle, nozzles, and trigger valve was developed for similar connection. This small hand-operated spraying attachment is used in small restricted places as is the dust gun for fly, roach, and ant control. A manifold installed on the compressed air line of the sprayer permits the connection of either the dust gun or the spray bottle. Sufficient hose is provided to permit the use of accessories inside a building while the sprayer, with its gasoline engine operating, is outside the building.

Field tests by the Departments of Army, Navy, and Agriculture indicate that the sprayer is suitable for classification as standard equipment for use by all segments of the Department of Defense.

This equipment item is now being sent forward for Navy review and standard procurement action. Navy activities will be appropriately notified when it becomes available through normal supply channels. (Press Release, U. S. Army Engineer Research and Development Laboratories)

* * * * *

Tuberculosis Organisms Resistant to Drugs

Improved surgical techniques, modern drug therapy, and an increasing trend toward home care have resulted in a pronounced shortening of the hospital stay of patients with tuberculosis.

Persons who have had this disease are living longer and this increased length of life and the care of the patients at home, plus drug therapy which nearly all patients receive, have created problems of their own. Two of these problems, the incidence of hospitalized patients in whom the tubercle bacilli are resistant to antituberculosis drugs on first admission and the rate of relapse among tuberculous patients who have been discharged previously from any tuberculosis hospital, were made the subject of a study sponsored by the California Tuberculosis and Health Association.

A questionnaire requesting information concerning admissions, discharges, evidence of drug-resistant organisms in sputum, and relapse

rates was sent to fifteen tuberculosis hospitals with 4121 beds among the State's approximately 11,500 beds for tuberculosis. To obtain a valid sample, a small research hospital, a large county hospital, a group of medium sized county sanatoriums, and a private hospital were included. Four specific questions were included in the questionnaire:

1. What is the incidence of patients who have left your hospital for any reason whatever and who have a positive sputum?
2. What is the incidence of patients discharged with positive sputum whose sputum possesses organisms resistant to one of the antituberculosis drugs? and to which drugs?
3. What is the incidence of patients admitted to your hospital for the first time with positive sputum whose organisms are found to be drug-resistant to one or more antituberculosis drugs? and to which drugs?
4. What is the percentage of patients admitted to your hospital after having once been discharged from any institution as inactive?

An early inquiry here indicated that no nationwide data are available on relapse rate or on sputum status of patients admitted to hospitals.

However, in 1955, Chaves and co-workers reported on 898 patients observed by physicians in the New York City Department of Health for a period of 18 months. M. tuberculosis was demonstrated by culture of the specimens of 385 patients. Of the 43 patients (11%) from whom strains were isolated which showed any resistance to streptomycin or isoniazid, only 15 (3.9%) were significantly resistant. These 15 made up 1.7% of the series of 898.

Beck reported 10 cases of pulmonary infection with drug-resistant tubercle bacilli in a 5-year study of 600 cases of newly diagnosed tuberculosis admitted to a New York State Tuberculosis Hospital. This is about 2% of the 480 who had positive sputum, or 1.7% of the 600 studied.

In a study among 5559 patients discharged from fifteen institutions in 1954, 879 (15.8%) had sputum positive for tubercle bacilli at the time of discharge. The lowest rate for any of the fifteen institutions was 1.9% and the highest was 28.3%. Many of the discharges were against medical advice.

During 1954, the fifteen institutions reported an average length of stay of 240.8 days reflecting the trend toward a shorter hospital stay.

The following table shows the number of sputum-positive patients admitted to four institutions who were found to be resistant to one or more of the antituberculosis drugs. At the time of this study, only four of the fifteen institutions included reported that drug sensitivity tests were being conducted. For those four hospitals, the total number of patients admitted during 1954 was 762, of whom 89 (11.7%) had positive sputum with organisms resistant to one or more antituberculosis drugs.

The four institutions reporting as having conducted drug sensitivity tests had a total of 762 first admissions during 1954. Of these patients, 13 (2.4%) were found to be resistant to paramino salicylic acid, 26 (3.4%) to isoniazid, and 34 (4.5%) to streptomycin.

Thus, 7.9% of the total number of patients admitted were found to be significantly resistant to isoniazid or streptomycin. This is about four times the incidence reported by both Chaves and Beck (1.7% of each total series studied).

INCIDENCE OF PATIENTS ADMITTED TO FOUR INSTITUTIONS
WITH POSITIVE SPUTUM IN WHOM ORGANISMS WERE RESISTANT
TO ONE OR MORE ANTITUBERCULOSIS DRUGS *

Institution Number	Total First Admissions 1954	Total First Admissions, Positive Sputum and Drug Resistant	Percent Positive Sputum and Drug Resistant
3	377	45	11.9
5	160	15	9.4
7	67	17	25.4
13	158	12	7.6

* Includes all drugs.

Ten of the fifteen institutions reporting submitted complete data relative to the number of patients admitted who had been discharged from any tuberculosis hospital previously with disease inactive. The rate of relapse among patients in these ten institutions in 1954 is approximately one of every 5 patients admitted. These data are probably not accurate as the patient's word was taken for the diagnosis at the time of previous discharge. Some patients may have been ignorant or forgetful—particularly those who left against medical advice.

Several interesting and significant facts came to light: In the fifteen institutions reporting, the proportion of patients discharged with sputum positive for tubercle bacilli averaged 15.8%. The range of 1.9 to 28.3%

was wide and the disparity was unexplained. One might hazard the guess that those hospitals having the higher rates also had a high rate of patients signing out against medical advice.

Only four of the fifteen institutions reported drug sensitivity tests of positive sputums on entry. No reliable data as to drug resistance could be found for patients who had a positive sputum at the time of discharge. Drug sensitivity studies are important in workmen's compensation cases and from a public health and treatment standpoint. More tuberculosis institutions should be encouraged to carry out drug sensitivity studies on sputum. The importance of drug sensitivity studies on the bacilli of patients being considered for operation cannot be too strongly emphasized.

The significance of present drug resistance studies is not entirely clear as there are differences of opinion regarding the pathogenicity of some drug-resistant bacilli. The probability is that as more drugs are used in treating tuberculosis, more resistant strains will be developed. Among patients admitted to the hospital for the first time whose sputum was positive for tubercle bacilli, 11.7% had organisms resistant to one or more antituberculosis drugs. More research is necessary to ascertain the nature of resistant organisms and to prevent resistance from occurring. Perhaps a way can be found to cause the bacilli to revert to a sensitive state.

The proportion of readmittances to tuberculosis hospitals is sizeable. Perhaps it should not be called a relapse rate inasmuch as not enough is known about the facts behind previous admissions. In any case, an average readmittance rate of 19.2% seems much higher than it should be. (Gompertz, J. L., Porter, D. E., Tuberculosis Organisms Resistant to Drugs: California Med., December 1956; abstracted in Tuberculosis Abstracts, Nat. Tuberc., A., XXX: 7, July 1957)

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Biological Hazards of Microwave Radiation

The potential health hazards due to electromagnetic radiations is rapidly becoming one of most serious concern. The following information has been abstracted from a paper, A Summary of SAMUSAF Program for Research on the Biomedical Aspects of Microwave Radiation by Major D. B. Williams USAF (MC) and Colonel R. S. Fixott USAF (MC), which was presented at the Proceedings of the Tri-Service Conference on Biological Hazards of Microwave Radiation held 15 - 16 July 1957 at the Rome Air Development Center.

About 3 years ago, a review of existing information established the following conclusions: (1) Microwave injury had been qualitatively demonstrated in animals, but had not been observed clinically in radar personnel; (2) animal eyes, and particularly the testes, were especially vulnerable

to the shorter wave lengths; (3) experimental injury appeared thermal in nature; i. e., temperatures induced in the affected regions were sufficiently high to account for injury on a thermal basis; and (4) no reliable information existed on the power densities of the modern radar beam and the parameters of injurious exposure were unknown.

Research work during the past 3 years showed that experimental cataracts could be produced in rabbits by several minutes of exposure to power densities in the range of 500 to 600 milliwatts/cm². The threshold of experimental ocular injury for a single sustained exposure of 270 minutes was bracketed between 120 and 220 mw/cm². Temperatures significant in cataract production were bracketed between 49° and 53° C. (Measured in the vitreous at the posterior lens capsule; these limits recently have been rather conclusively refined to 49° to 50° C. in the same region.) Of considerable interest was the observation that detectable testicular changes could be produced in the rat by 15 to 20 minutes of sustained exposure to 30 to 40 mw/cm². (These limits subsequently were pursued to lower levels and it is believed that 5 to 10 mw/cm² is the steady state dose rate limit for testicular exposure at "S"-band frequencies). The minimum testicular temperature associated with injury was between 38° and 40° C. It was concluded that the experimental ocular and testicular injury thresholds should be regarded as hazardous for man, but that the risk of injury was minimal under current standard operational conditions. No substantial evidence of human injury having resulted from accidental exposure to radio frequency (rf) radiation, under either field or laboratory conditions, was available up to November 1956.

Considerable contract research has been in progress during the past 2-1/2 years. The tentative conclusions reached as a result of this research may be summarized as follows: (1) It has been demonstrated that 3 cm and 12.3 cm radiation could injure the hollow viscera of small animals. This work in the "S"-band frequency was extended to a study of functional effects in larger animals, namely, the dog. Both single exposure of 2-1/2 to 3 hours duration and repeated exposures, each of the same duration, were studied. The power density employed was on the order of 300 to 400 mw/cm² of 12.3 cm radiation, sufficient to maintain skin temperature between 43° and 45° C. which is close to, but below, the level required to produce burns. These exposures in the dog eventually produced temperatures typically of 41.3° C. in the liver, 41.5° C. in the stomach, 41.5° C. in the gall bladder, 42.4° C. in the intestines, and 43.6° C. in the skin. To date, the studies have failed to reveal any functional liver damage. It has been noted that these exposures have not produced the dramatic results observed in smaller animals, rats, guinea pigs, hamsters, and rabbits. The tentative explanation of this difference is based on a comparison of the ratio of exposed body area to total profile body surface. It is tentatively concluded that an even lesser effect would be experienced by man in a similar exposure situation. (2) Studies on rabbits exposed to

2450 megacycles/second ("S"-band) have led to the determination of empirical threshold for opacity or a cataract production resulting from a single acute exposure. A temperature of 49° to 50° C. at the posterior lens capsule has definitely been shown to be significant in lens injury in rabbits so that it seems reasonably certain that a thermal effect is involved. It has been previously demonstrated in cutaneous studies that cellular death from hyperthermia and probably coagulation is encountered at 5 to 10 minutes of exposure to temperatures of 49° to 50° C.

Summary. The progress of the Air Force-Navy program to date best seems summarized by recalling that only 3 years ago the sole data available on microwave tolerance was that an estimated 3000 mw/cm² should be regarded as hazardous for personnel exposure. In the interim, the limits of today have been scientifically refined to a level of 10 mw/cm² for a significant portion of the microwave-rf spectrum. Current work will provide limits for other frequencies.

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Industrial Medicine - A New Specialty

Recognition of industrial medicine as a specialty by organized medicine in the United States will ultimately benefit both industry and medicine. It does not preclude the part-time nonspecialist from serving smaller industries in which his services are urgently needed. The qualifications needed by the part-time industrial physician are not difficult to attain provided he has a genuine interest in the field. Industrial health services are distinct and separate from comprehensive medical care with obvious but often intangible values. A core of basic preventive medical services is needed by every industry regardless of size. Responsibilities of the industrial health team are to:

Protect employee and employer alike from hazards arising out of, and in the course of, employment.

Establish every known principle and procedure of preventive and curative medicine to safeguard and improve personnel health.

Attune the health program to the objectives of the industry with regard to economy and efficiency on one side and health needs on the other.

Advise all personnel on policies having a health aspect. These range from job placement to medical care included in fringe benefits.

Act as a bridge between the industry and community health, safety, and welfare agencies so that employees and their families may take full advantage of community facilities. (Shepard, W.P., Industrial Medicine - A New Specialty: Canad. Med. Assn. J., 77: 206-211, August 1, 1957)

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SAFE WINTER DRIVING TIPS

(Traffic Safety, November 1957)



Be Prepared for Winter

Winterize your car, your driving technique and your attitude. Accept the fact that normal speeds are often too fast for winter conditions. Whenever weather is bad, slow down.



Get the Feel of the Road

Test road conditions right away. As soon as you start out (but away from other cars or hazards) try your brakes to find out how slippery the road surface is.



Make Sure You Can See

Don't drive blind. Keep windshield and windows clear. Maintain wiper blades, heater and defroster in proper operating condition. Ventilate to keep inside of windows clear.



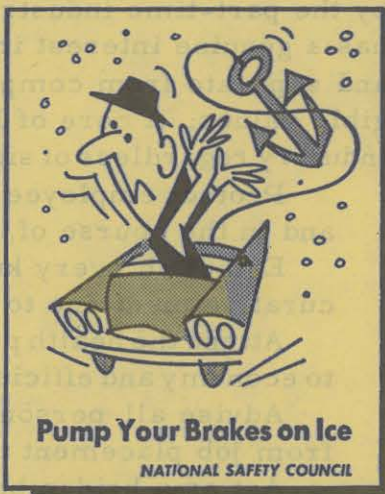
Take Along Chains

Check your tires. Whether you use regular or snow tires, keep them in good condition. Use reinforced tire chains for deep or hard-packed snow, ice, and in emergency situations.



Don't Follow Too Closely

Following too closely, always a hazard, is especially dangerous in winter. Keep well back of the vehicle ahead to give yourself plenty of room for an emergency stop.



Pump Your Brakes on Ice

NATIONAL SAFETY COUNCIL

To stop quickly, pump your brakes in a series of fast applications. Jamming on the brakes will lock the brakes and throw the car into an uncontrollable skid. Keep your head.

Waterless Hand Cleaners

Fifteen waterless hand cleaners representative of three basic types were evaluated in laboratory and field usage trials to obtain information regarding their behavior on skin compared to that of five conventional industrial hand cleaners and one synthetic detergent.

Selected standards known to be practical in the study of potential cutaneous irritant effects and physical characteristics of soaps, detergents, and solvents were utilized. As a result of the evaluation, eleven of the fifteen waterless cleaners were classed as satisfactory while four were definitely inferior in performance.

Those cleaners classed as wetting agent type were found to be preferable to those classed as solvent type. Cleaners which contained alkali or combinations of alkali and solvent were associated with more irritant action on the skin than was seen with the other types. Aromatic hydrocarbons should not be incorporated into the cleaner solvent.

Waterless hand cleaners have a practical application for usage under a variety of conditions:

1. Where workmen encounter tar, paint, heavy greases, dyes, inks, and other tenacious soils.
2. In areas where workmen must walk long distances to obtain washing facilities.
3. On aircraft, submarines, and surface vessels where water storage may constitute a problem.
4. In tropical and polar installations, provided the specific cleaner can meet temperature requirements.
5. In those operations where machinists, mechanics, field crews, and maintenance men are in contact with variable degrees of tenacious soilage.

The waterless cleaners which were tested represented fair to high grade products except for the few considered inferior. As a group, they can replace effectively raw solvents for hand-cleaning purposes. Some are definitely superior to most conventional hand cleaners for rapidly removing certain tenacious soils. By no means, are waterless cleaners exclusive substitutes for conventional products, but they are more convenient and efficient for selective usage. (Birmingham, D.J., Perone, V.B., Waterless Hand Cleaners: *Indust. Med. Surg.*, 26: 361-368, August 1957)

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Chromate Dermatitis

Chromate dermatitis in industry is widespread. The aviation industry has added a significant number of cases to the total. Exposure is often ubiquitous. It constitutes a different and protracted problem, often

imitating nummular eczema. The natural evolution of the disease apparently requires a healing time of approximately 12 weeks without further exposure to chromates. Because relatively small amounts of chromates are sufficient to cause a continuing dermatitis, treatment must be combined with absolute avoidance of contact with chromates.

Treatment with local corticosteroids combined with neomycin gives, at the present time, the quickest results in chromate eczema. Prednisolone 0.5% ointment combined with neomycin seems to be somewhat superior to 1.0% hydrocortisone ointment combined with neomycin. These results were obtained with use of the paired symmetrical simultaneous comparison method of Sulzberger during periods of continued exposure to chromates, minimal exposure to chromates, and absolute nonexposure to chromates. (Bernhardt, H. J., Chromate Dermatitis, Its Natural History and Treatment: Arch. Derm., 76: 13-16, July 1957)

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